WHAT IS CLAIMED IS:

1. An inverter device for driving a sensorless DC brushless motor, comprising:

an inverter circuit (37) for switching a direct-current voltage obtained from a direct-current power source and supplying an alternating-current current of a sinusoidal wave to the sensorless DC brushless motor; and

current detecting means (6) for detecting a power supply current between the direct-current power source and the inverter circuit,

wherein the sensorless DC brushless motor includes stator windings (4) of a three-phase wiring (U, V, W) electrically connected to the inverter circuit (37) and a magnet rotor (5), and

the current detecting means (6) is a single current detecting means which is used also for detecting the current flowing in the stator windings (4), and by detecting the current flowing in the stator windings as well as detecting the power supply current, a rotational position of the magnet rotor is judged to thereby control the switching of the inverter circuit.

2. The inverter device according to claim 1, wherein the direct-current voltage of the direct-current power source is switched by three-phase modulation.

3. The inverter device according to claim 2, wherein within a carrier period of the three-phase modulation, a current feeding time is

equally added or subtracted in a current feeding period in each phase of the stator windings.

4. The inverter device according to claim 1 or 2, wherein within a carrier period, the current feeding timing to each phase of the stator windings is shifted, so that the current flowing in the stator windings is detected by the current detecting means (6).

5. The inverter device according to any one of claims 1 to 4, which is adapted to be mounted on a vehicle.

6. The inverter device according to any one of claims 1 to 5, driving the sensorless DC brushless motor (31) which is a driving source of the compressor (40).

7. An air conditioner comprising a compressor (40), a sensorless DC brushless motor (31) acting as a driving source of the compressor, and an inverter device (20) adapted for driving the brushless motor,

wherein the inverter device (20) comprises:

an inverter circuit (37) for switching a direct-current voltage obtained from a direct-current power source (1) and supplying an alternating-current current of a sinusoidal wave to the sensorless DC brushless motor; and

current detecting means (6) for detecting a power supply current between the direct-current power source and the inverter circuit,

wherein the sensorless DC brushless motor includes stator windings (4) of a three-phase wiring (U, V, W) electrically connected to the inverter circuit (37) and a magnet rotor (5), and

the current detecting means (6) is a single current detecting means which is used also for detecting the current flowing in the stator windings (4), and by detecting the current flowing in the stator windings as well as detecting the power supply current, a rotational position of the magnet rotor is judged to thereby control the switching of the inverter circuit.

8. The air conditioner according to claim 7, wherein the inverter device switches the direct-current voltage from the direct-current power source by three-phase modulation.

9. The air conditioner according to claim 8, wherein the inverter device, within a carrier period of the three-phase modulation, a current feeding time is equally added or subtracted in a current feeding period in each phase of the stator windings.

10. The air conditioner according to claim 7 or 8, wherein the inverter device shifts the current feeding timing to each phase of the stator windings within a carrier period, so that the current flowing in the stator windings is detected by the current detecting means (6).

11. The air conditioner according to any one of claims 7 to 10, wherein the inverter device is adapted to be mounted on a vehicle.

12. The air conditioner according to any one of claims 7 to 11, wherein the inverter device is integrally coupled to the compressor (40) together with the sensorless DC brushless motor (31).

13. The air conditioner according to claim 12 comprising a suction pipe (38), which is adapted to the compressor, for sucking a refrigerant for cooling the inverter device.

14. The air conditioner according to claim 13, wherein the inverter device (20) is disposed beneath the suction pipe (38).

15. The air conditioner according to claim 13 or 14, wherein the inverter device (20) is disposed between the suction pipe (38) and the compressor (40).